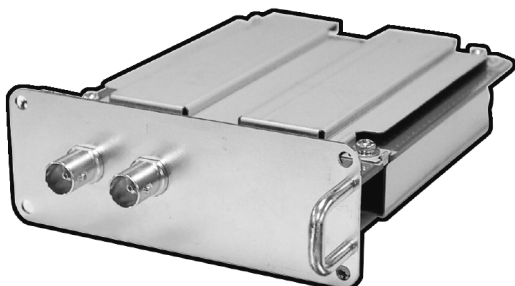


# Service Manual

## HD-SDI Terminal Board

### TY-FB9HD



#### ⚠ WARNING

This service information is designed for experienced service personnel only and is not designed for use by the general public. It does not contain warnings or cautions to advise non-technical individuals of potential danger in attempting to service a product. Products powered by electricity should be serviced or repaired only by experienced service personnel. Any attempt to service or repair the product or products dealt with in this service information by anyone else could result in serious injury or death.

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# 1 Safety Precautions

## 1.1. General Guidelines

1. When servicing, observe the original lead dress. If a short circuit is found, replace all parts which have been overheated or damaged by the short circuit.
2. After servicing, see to it that all the protective devices such as insulation barriers, insulation papers shields are properly installed.
3. After servicing, make the following leakage current checks to prevent the customer from being exposed to shock hazards.

### 1.1.1. Leakage Current Cold Check

1. Unplug the AC cord and connect a jumper between the two prongs on the plug.
2. Measure the resistance value, with an ohmmeter, between the jumpered AC plug and each exposed metallic cabinet part on the equipment such as screwheads, connectors, control shafts, etc. When the exposed metallic part has a return path to the chassis, the reading should be between  $1M\Omega$  and  $5.2M\Omega$ .

When the exposed metal does not have a return path to the chassis, the reading must be  $\infty$ .

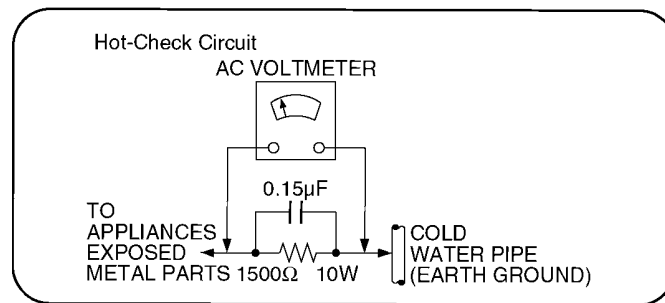


Figure 1

### 1.1.2. Leakage Current Hot Check (See Figure 1.)

1. Plug the AC cord directly into the AC outlet. Do not use an isolation transformer for this check.
2. Connect a  $1.5k\Omega$ , 10 watts resistor, in parallel with a  $0.15\mu F$  capacitors, between each exposed metallic part on the set and a good earth ground such as a water pipe, as shown in Figure 1.
3. Use an AC voltmeter, with 1000 ohms/volt or more sensitivity, to measure the potential across the resistor.
4. Check each exposed metallic part, and measure the voltage at each point.
5. Reverse the AC plug in the AC outlet and repeat each of the above measurements.
6. The potential at any point should not exceed 0.75 volts RMS. A leakage current tester (Simpson Model 229 or equivalent) may be used to make the hot checks, leakage current must not exceed 1/2 milliamp. In case a measurement is outside of the limits specified, there is a possibility of a shock hazard, and the equipment should be repaired and rechecked before it is returned to the customer.

## 2 Prevention of Electro Static Discharge (ESD) to Electrostatically Sensitive (ES) Devices

Some semiconductor (solid state) devices can be damaged easily by static electricity. Such components commonly are called Electrostatically Sensitive (ES) Devices. Examples of typical ES devices are integrated circuits and some field-effect transistors and semiconductor "chip" components. The following techniques should be used to help reduce the incidence of component damage caused by electro static discharge (ESD).

1. Immediately before handling any semiconductor component or semiconductor-equipped assembly, drain off any ESD on your body by touching a known earth ground. Alternatively, obtain and wear a commercially available discharging ESD wrist strap, which should be removed for potential shock reasons prior to applying power to the unit under test.
2. After removing an electrical assembly equipped with ES devices, place the assembly on a conductive surface such as aluminum foil, to prevent electrostatic charge buildup or exposure of the assembly.
3. Use only a grounded-tip soldering iron to solder or unsolder ES devices.
4. Use only an anti-static solder removal device. Some solder removal devices not classified as "anti-static (ESD protected)" can generate electrical charge sufficient to damage ES devices.
5. Do not use freon-propelled chemicals. These can generate electrical charges sufficient to damage ES devices.
6. Do not remove a replacement ES device from its protective package until immediately before you are ready to install it. (Most replacement ES devices are packaged with leads electrically shorted together by conductive foam, aluminum foil or comparable conductive material).
7. Immediately before removing the protective material from the leads of a replacement ES device, touch the protective material to the chassis or circuit assembly into which the device will be installed.

### Caution

Be sure no power is applied to the chassis or circuit, and observe all other safety precautions.

8. Minimize bodily motions when handling unpackaged replacement ES devices. (Otherwise harmless motion such as the brushing together of your clothes fabric or the lifting of your foot from a carpeted floor can generate static electricity (ESD) sufficient to damage an ES device).

### IMPORTANT SAFETY NOTICE

There are special components used in this equipment which are important for safety. These parts are marked by  $\triangle$  in the schematic diagrams, Exploded Views and replacement parts list. It is essential that these critical parts should be replaced with manufacturer's specified parts to prevent shock, fire, or other hazards. Do not modify the original design without permission of manufacturer.

### 3 About lead free solder (PbF)

**Note:** Lead is listed as (Pb) in the periodic table of elements.

In the information below, Pb will refer to Lead solder, and PbF will refer to Lead Free Solder.

The Lead Free Solder used in our manufacturing process and discussed below is (Sn+Ag+Cu).

That is Tin (Sn), Silver (Ag) and Copper (Cu) although other types are available.

This model uses Pb Free solder in it's manufacture due to environmental conservation issues. For service and repair work, we'd suggest the use of Pb free solder as well, although Pb solder may be used.

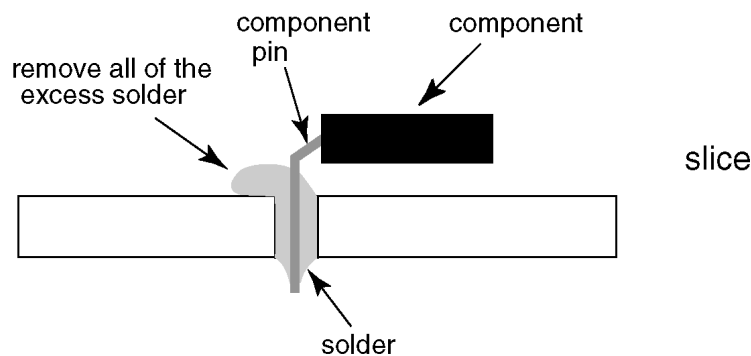
PCBs manufactured using lead free solder will have the PbF within a leaf Symbol stamped on the back of PCB.

#### Caution

- Pb free solder has a higher melting point than standard solder. Typically the melting point is 50 ~ 70 °F (30~40°C) higher. Please use a high temperature soldering iron and set it to 700 ± 20 °F (370 ± 10 °C).
- Pb free solder will tend to splash when heated too high (about 1100 °F or 600 °C).

If you must use Pb solder, please completely remove all of the Pb free solder on the pins or solder area before applying Pb solder. If this is not practical, be sure to heat the Pb free solder until it melts, before applying Pb solder.

- After applying PbF solder to double layered boards, please check the component side for excess solder which may flow onto the opposite side. (see figure below)



#### Suggested Pb free solder

There are several kinds of Pb free solder available for purchase. This product uses Sn+Ag+Cu (tin, silver, copper) solder. However, Sn+Cu (tin, copper), Sn+Zn+Bi (tin, zinc, bismuth) solder can also be used.

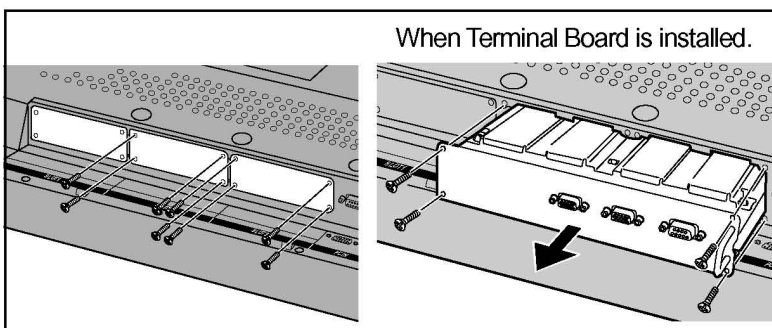
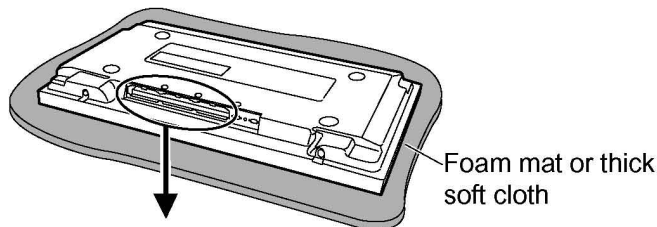
0.3mm X 100g	0.6mm X 100g	1.0mm X 100g

## 4 Replacement

The following explanation uses the 42/50-inch plasma display as an example. The terminal board shown is a typical example of one that can be replaced.

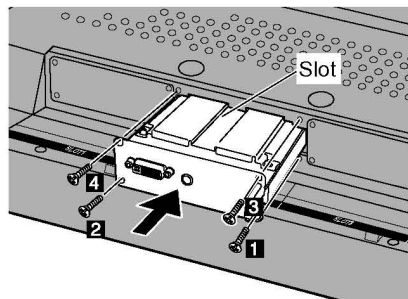
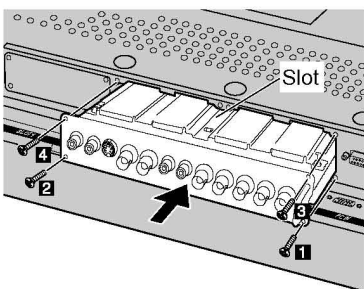
- Before proceeding with the replacement steps, be sure to turn off the entire system including the display, unplug all components from their outlets, and disconnect all the interconnect cables from the display.

The following example shows installation of a dual slot size board and a single slot size board.



### 1. Removing the dummy cover or mounted terminal board from display:

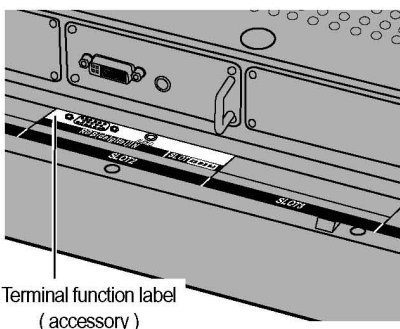
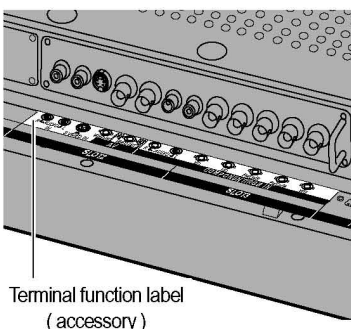
- Remove the slot cover securing screws (4 or 8 screws) on the back of the display. If a terminal board is already installed, grip the handle of the terminal board, and slowly pull out in the direction of the arrow.



### 2. Installing desired Terminal Board:

1. Insert the desired Terminal Board into the slot until it is firmly plugged into the card connector.
  - Make sure that the Board does not ride on the two lower claws.
2. Secure using the previously removed screws or those supplied with the unit. Tighten screws in the numbered order **1 - 4**.

Please note that there are slot fastening screws at 4 points on each slot (at 2 locations on both the left and right edges), so the number of fastening screws will vary depending on the number of slot insertions. Be sure to fasten all screws tightly.



### 3. Applying the terminal function label:

Peel off the backing sheet from the terminal function label (accessory) and affix it over the existing label.

- Make sure that the label is affixed with the correct position.

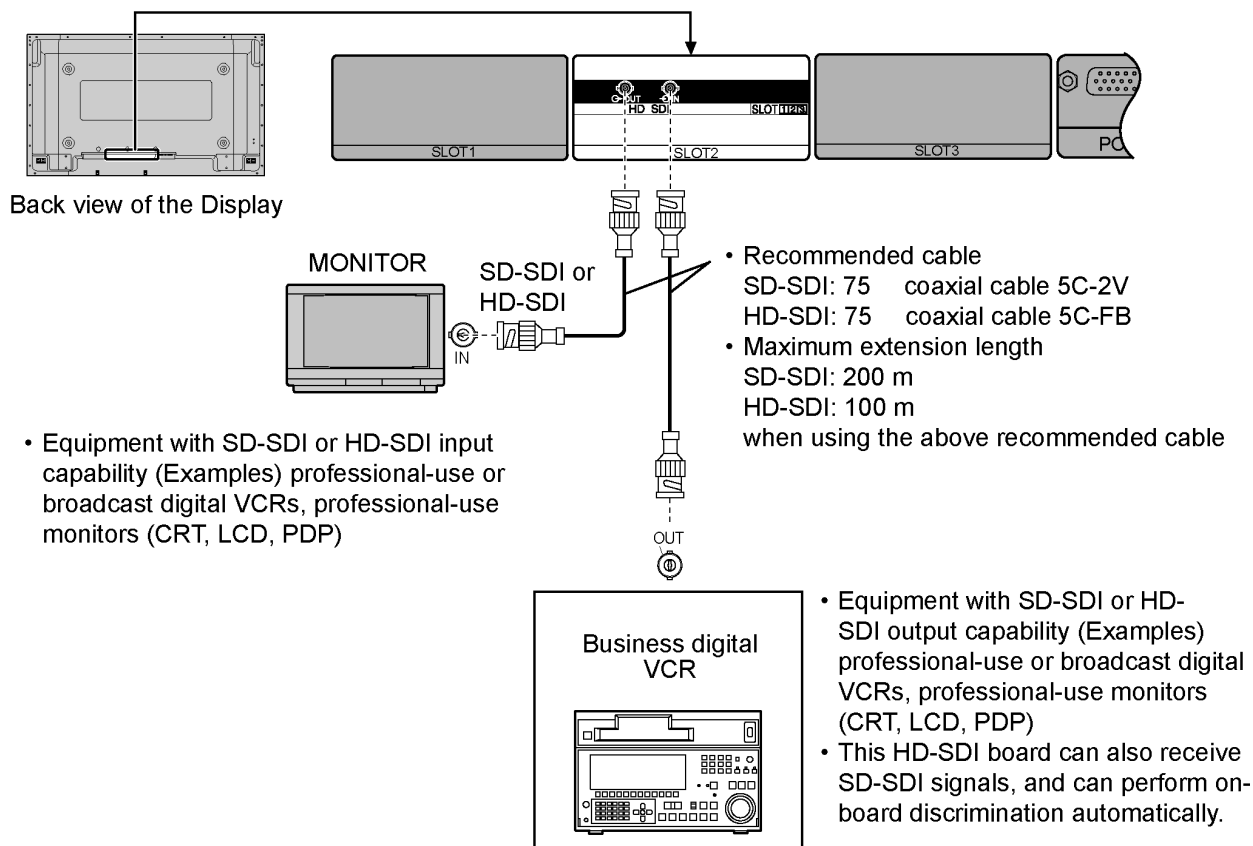
Have the customer keep the removed Terminal Board for future servicing needs.

## 5 Connection

Slot Nos. of the display unit that are compatible with terminal board attachments

2 slots model	Slot1 , Slot2
3 slots model	Slot1 , Slot2 (Slot3 is not compatible)

## Connection



### Applicable input signals

Video signal

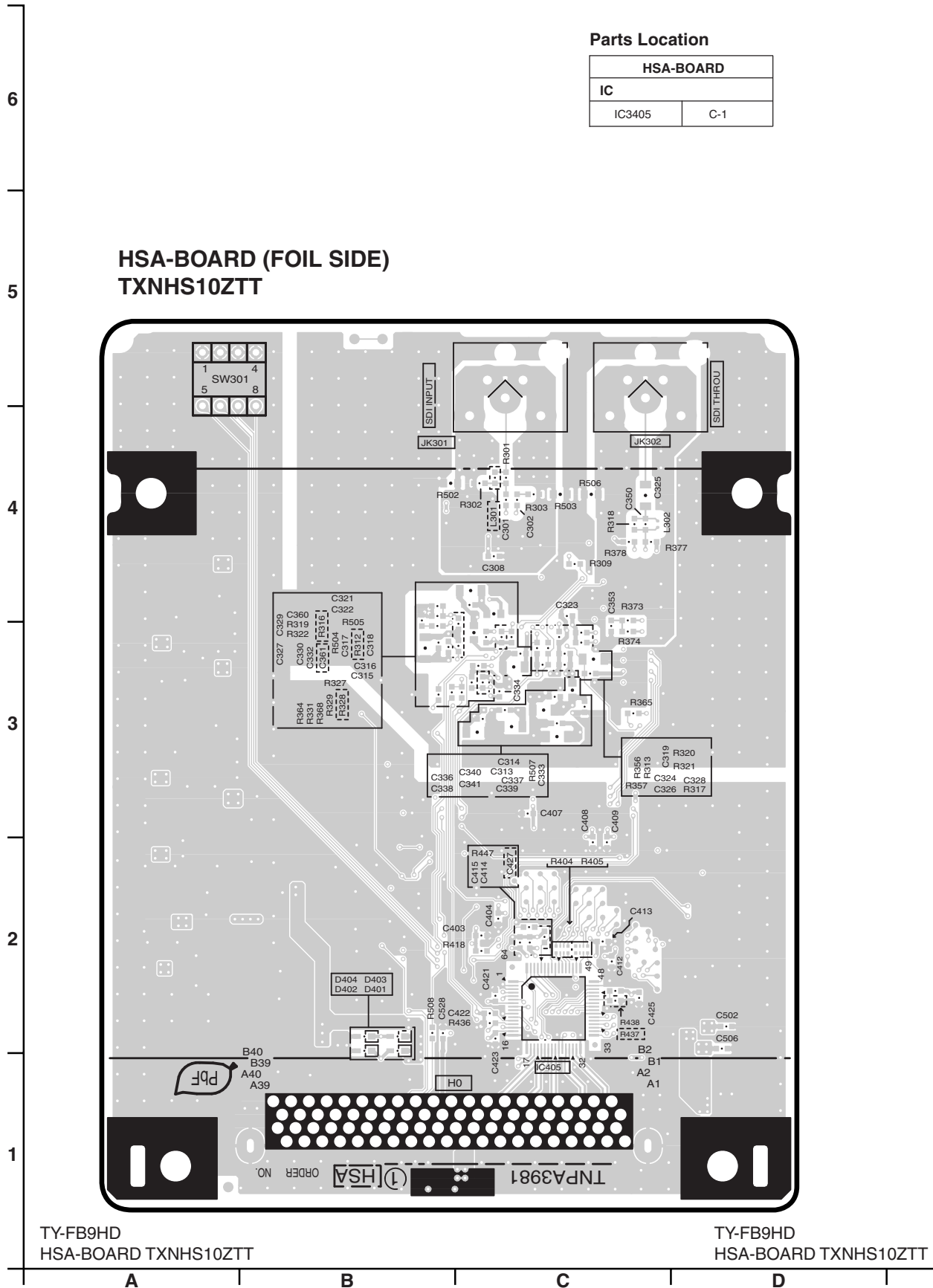
	Signal format	fV (Hz)	Scanning format	fH (kHz)	Dot clock (MHz)	Number of active pixels	Total number of pixels	Number of active lines	Total number of lines
1	1125 (1080) / 60i : 59.94i	60	2:1 Interlace	33.75	74.25	1920	2200	1080	1125
2	1125 (1080) / 50i	50	2:1 Interlace	28.125	74.25	1920	2640	1080	1125
3	750 (720) / 60p : 59.94p	60	Progressive	45	74.25	1280	1650	720	750
4	750 (720) / 50p	50	Progressive	37.5	74.25	1280	1980	720	750
5	1125 (1080) / 24sF : 23.985sF	48	Progressive (sF)	27	74.25	1920	2750	1080	1125
6	1125 (1080) / 30p	30	Progressive	33.75	74.25	1920	2200	1080	1125
7	1125 (1080) / 25p	25	Progressive	28.125	74.25	1920	2640	1080	1125
8	1125 (1080) / 24p	24	Progressive	27	74.25	1920	2750	1080	1125
9	525 (480) / 59.94i	59.94	2:1 Interlace	15.734	27	1440	1716	486	525
10	625 (575) / 50i	50	2:1 Interlace	15.625	27	1440	1728	576	625

#### Notes:

- (1) Additional equipment and cables shown are not supplied with this set.
- (2) Currently there is no support for embedded audio.

# 6 Circuit Board Layout

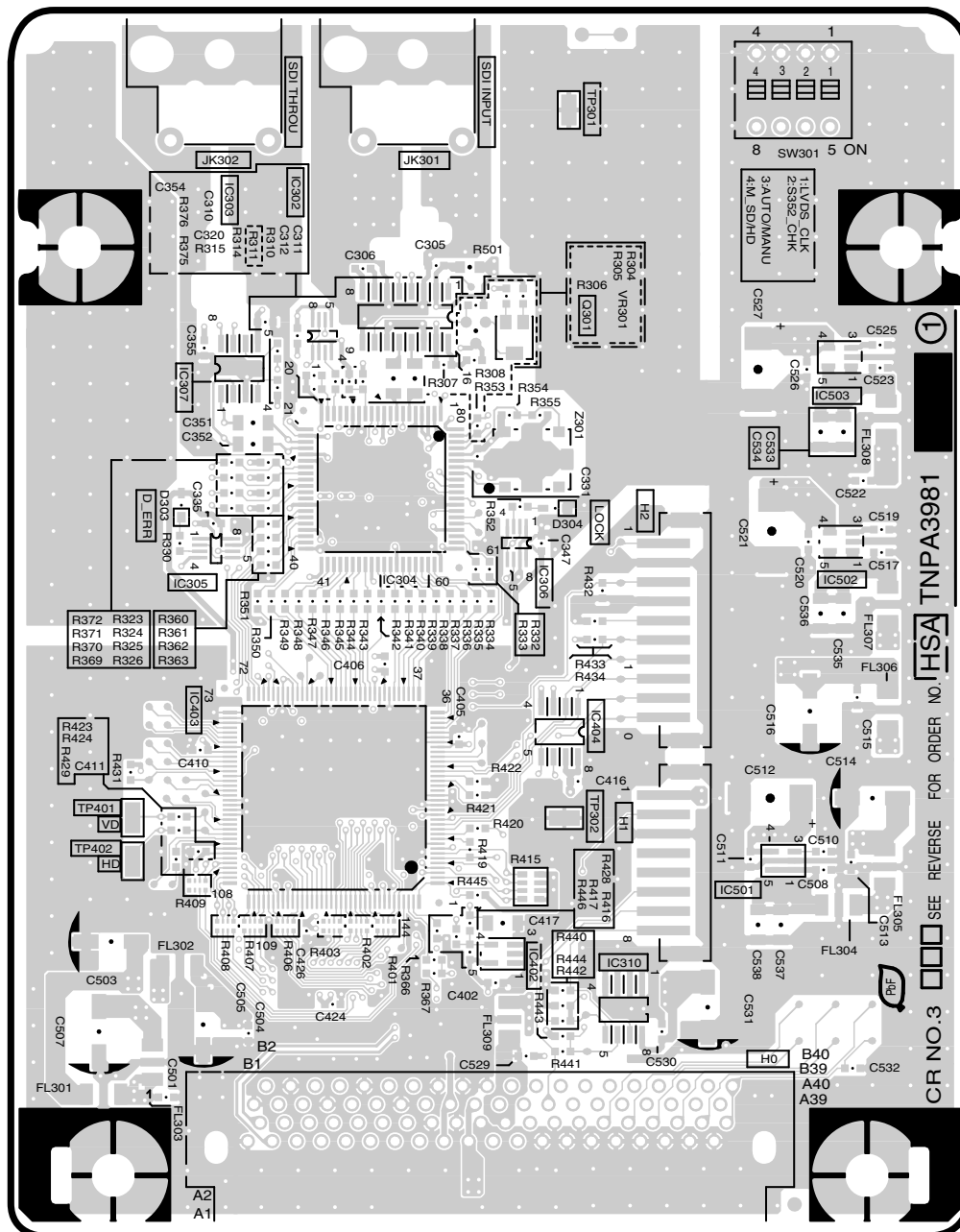
## 6.1. HSA-Board



## Parts Location

HSA-BOARD					
IC		IC3402	C-2	TP	
IC3302	B-4	IC3403	A-2	TP3301	C-5
IC3303	B-4	IC3404	C-2	TP3302	C-2
IC3304	B-3	IC3501	C-2	TP3401	A-2
IC3305	A-3	IC3502	D-3	TP3402	A-2
IC3306	C-3	IC3503	D-4		
IC3307	A-4	TRANSISTOR			
IC3310	C-2	Q3301	C-4		

**HSA-BOARD (COMPONENT SIDE)**  
**TXNHS10ZTT**



TY-FB9HD  
HSA-BOARD TXNHS10ZTT

TY-FB9HD  
HSA-BOARD TXNHS10ZTT









# 7 Block and Schematic Diagram

## 7.1. Schematic Diagram Notes

**Important Safety Notice**

Components identified by  $\triangle$  mark have special characteristics important for safety.  
When replacing any of these components, use only manufacture's specified parts.

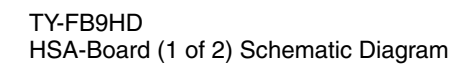
**Notes:**

- 1. **Resistor**  
Unit of resistance is OHM [ $\Omega$ ] (K=1,000, M=1,000,000).
- 2. **Capacitor**  
Unit of capacitance is  $\mu$ F, unless otherwise noted.
- 3. Coil  
Unit of inductance is  $\mu$ H, unless otherwise noted.
- 4. Test Point  
 : Test Point position
- 5. Earth Symbol  
 : Chassis Earth (Cold)       : Line Earth (Hot)
- 6. Voltage Measurement  
Voltage is measured by a DC voltmeter.  
Conditions of the measurement are following:  
Receiving Signal ..... Colour Bar signal  
All customer's controls ..... Maximum positions
- 7. When arrow mark (  ) is found, connection is easily found from the direction of arrow.
- 8. Indicates the major signal flow.      : Video       Audio 
- 9. This schematic diagram is the latest at the time of printing and subject to change without notice.

**Remarks:**

- 1. The Power Circuit contains a circuit area which uses a separate power supplier to isolate the earth connection.  
The circuit is defined by HOT and COLD indications in the schematic diagram. Take the following precautions.  
All circuits, except the Power Circuit, are cold.  
Precautions
  - a. Do not touch the hot part or the hot and cold parts at the same time or you may be shocked.
  - b. Do not short- circuit the hot and cold circuits or a fuse may blow and parts may break.
  - c. Do not connect an instrument, such as an oscilloscope, to the hot and cold circuits simultaneously or a fuse may blow.  
Connect the earth of instruments to the earth connection of the circuit being measured.
  - d. Make sure to disconnect the power plug before removing the chassis.







## 8 Replacement Parts List

### 8.1. Replacement Parts List Notes

#### Important Safety Notice

*Components identified by  $\triangle$  mark have special characteristics important for safety.  
When replacing any of these components, use only manufacturer's specified parts.*

#### RTL (Retention Time Limited)

**Note:** The marking (RTL) indicates that the Retention Time is Limited for this item.

After the discontinuation of this assembly in production, the item will continue to be available for a specific period of time. The retention period of availability is dependant on the type of assembly, and in accordance with the laws governing part and product retention. After the end of this period, the assembly will no longer be available.

Abbreviation of part name and description

#### 1. Resistor

Example:

ERD25TJ104    C 100KOHM, J, 1/4W  
                                 Type                  Allowance

#### 2. Capacitor

Example:

ECKF1H103ZF    C 0.01UF, Z, 50V  
                                 Type                  Allowance

Type	Allowance
C : Carbon	F : $\pm 1\%$
F : Fuse	G : $\pm 2\%$
M : Metal Oxide Metal Film	J : $\pm 5\%$
S : Solid	K : $\pm 10\%$
W : Wire Wound	M : $\pm 20\%$

Type	Allowance
C : Ceramic	C : $\pm 0.25\text{pF}$
E : Electrolytic	D : $\pm 0.5\text{pF}$
P : Polyester	F : $\pm 1\text{pF}$
Polypropylene	G : $\pm 3\text{pF}$
T : Tantalum	J : $\pm 5\text{pF}$
	K : $\pm 10\text{pF}$
	L : $\pm 15\text{pF}$
	M : $\pm 20\text{pF}$
	P : +100%, -0%
	Z : +80%, -20%

## 8.2. Electrical Replacement Parts List

Ref. No.	Part No.	Part Name & Description	Pcs	Remarks
C3301,02	ECJ1XB0J105K	C 1UF, K, 16V	2	
C3305	ECJ1XF1C104Z	C 0.1UF, Z, 16V	1	
C3306	ECJ1XB0J105K	C 1UF, K, 16V	1	
C3308	ECJ1XF1C104Z	C 0.1UF, Z, 16V	1	
C3310	ECJ1XF1C104Z	C 0.1UF, Z, 16V	1	
C3311,12	ECJ3YB0J475K	C 47UF, J, 25V	2	
C3313	ECJ3XB1C105K	C 1UF, K, 16V	1	
C3314	ECJ1XF1C104Z	C 0.1UF, Z, 16V	1	
C3315	ECJ3XB0J106M	C 10UF, M, 6.3V	1	
C3316,17	ECJ1XF1C104Z	C 0.1UF, Z, 16V	2	
C3318,19	ECJ1XB1C104K	C 0.1UF, Z, 16V	2	
C3320	ECJ1VB1C103K	C 0.010UF, K, 16V	1	
C3321	ECJ3XB0J106M	C 10UF, M, 6.3V	1	
C3322,23	ECJ1XF1C104Z	C 0.1UF, Z, 16V	2	
C3324	ECJ1XB1C104K	C 0.1UF, Z, 16V	1	
C3325	ECJ3YB0J475K	C 47UF, J, 25V	1	
C3326	ECJ1XB1C104K	C 0.1UF, Z, 16V	1	
C3327	ECJ3XB0J106M	C 10UF, M, 6.3V	1	
C3328	ECJ3XB1C105K	C 1UF, K, 16V	1	
C3329	ECJ1XB1H102K	C 1000UF, Z, 50V	1	
C3330-32	ECJ1XB1C104K	C 0.1UF, Z, 16V	3	
C3333-37	ECJ1XF1C104Z	C 0.1UF, Z, 16V	5	
C3338,39	ECJ3XB0J106M	C 10UF, M, 6.3V	2	
C3340	ECJ1XF1C104Z	C 0.1UF, Z, 16V	1	
C3341	ECJ3XB0J106M	C 10UF, M, 6.3V	1	
C3347	ECJ1XF1C104Z	C 0.1UF, Z, 16V	1	
C3350	ECJ1VC1H1R5C	C 2.7PF, K, 50V	1	
C3351,52	ECJ3YB0J475K	C 47UF, J, 25V	2	
C3353	ECJ1XB1C104K	C 0.1UF, Z, 16V	1	
C3354,55	ECJ1XF1C104Z	C 0.1UF, Z, 16V	2	
C3360	ECJ1XB1C104K	C 0.1UF, Z, 16V	1	
C3402-16	ECJ1XF1C104Z	C 0.1UF, Z, 16V	15	
C3417	ECJ3XB1C105K	C 1UF, K, 16V	1	
C3421	ECJ1XF1C104Z	C 0.1UF, Z, 16V	1	
C3423-26	ECJ1XF1C104Z	C 0.1UF, Z, 16V	4	
C3501,02	ECJ1XF1C104Z	C 0.1UF, Z, 16V	2	
C3503	EEH1C470P	C 47PF, J, 16V	1	
C3504	ECJ1XF1C104Z	C 0.1UF, Z, 16V	1	
C3505	EEH1C470P	C 47PF, J, 16V	1	
C3506	ECJ1XF1C104Z	C 0.1UF, Z, 16V	1	
C3507	EEH1C470P	C 47PF, J, 16V	1	
C3508	ECJ1XB1C104K	C 0.1UF, Z, 16V	1	
C3510,11	ECJ1XB1C104K	C 0.1UF, Z, 16V	2	
C3512	EEFCD0J470R	47UF	1	
C3513	ECJ1XF1C104Z	C 0.1UF, Z, 16V	1	
C3514	EEH1C470P	C 47PF, J, 16V	1	
C3515	ECJ1XF1C104Z	C 0.1UF, Z, 16V	1	
C3516	EEH1C470P	C 47PF, J, 16V	1	
C3517	ECJ1XB1C104K	C 0.1UF, Z, 16V	1	
C3519,20	ECJ1XB1C104K	C 0.1UF, Z, 16V	2	
C3521	EEFCD0J470R	47UF	1	
C3522	ECJ1XF1C104Z	C 0.1UF, Z, 16V	1	
C3523	ECJ1XB1C104K	C 0.1UF, Z, 16V	1	
C3525,26	ECJ1XB1C104K	C 0.1UF, Z, 16V	2	
C3527	EEFCD0J470R	47UF	1	
C3528-30	ECJ1XF1C104Z	C 0.1UF, Z, 16V	3	
C3531	EEH1C470P	C 47PF, J, 16V	1	
C3532	ECJ1XF1C104Z	C 0.1UF, Z, 16V	1	
C3533-38	ECJ3XB1C106M	C 1.0UF, K, 16V	6	
D3303,04	LN1271RTR	LED	2	
FL3301-09	ELKE103FA	NOISE FILTER	9	
H0	K1KA80B00037	80P CONNECTOR	1	
H1	K1KA08AA0150	8P CONNECTOR	1	
H2	K1KA10AA0153	10P CONNECTOR	1	
IC3302	CIAB00001653	IC	1	

Ref. No.	Part No.	Part Name & Description	Pcs	Remarks
IC3303	COJBAB002217	IC	1	
IC3304	CIAB00001900	IC	1	
IC3305,06	COJBAB002217	IC	2	
IC3307	CIAB00001654	IC	1	
IC3310	TVRN416	IC	1	
IC3402	PST9128NR	IC (LOGIC)	1	
IC3403	CI2BZ0002385	IC	1	
IC3404	TVRP126	IC	1	
IC3405	COJBAP000020	IC	1	
IC3501	COCBCAD00016	IC	1	
IC3502	COCBCAD00015	IC	1	
IC3503	COCBCBD00008	IC	1	
JK3301,02	K1QBB1BB0014	CONNECTOR	2	
L3302	ELJRF5N6DBB	CHIP COIL	1	
R3301,02	ERJ3EKF75R0	M 0.75HM, 1/16W	2	
R3303	ERJ3EKF39R0	M 39 OHM, 1/16W	1	
R3309	ERJ3GEYJ101	M 100 OHM, J, 1/16W	1	
R3310	ERJ3GEY0R00	M 0 OHM, 1/16W	1	
R3313	ERJ3GEYJ330	M 33 OHM, J, 1/16W	1	
R3314	ERJ3GEYJ222	M 2.2KOHM, J, 1/16W	1	
R3315	ERJ3GEYJ271	M 270 OHM, J, 1/16W	1	
R3317	ERJ3GEYJ222	M 2.2KOHM, J, 1/16W	1	
R3318	ERJ3EKF75R0	M 0.75HM, 1/16W	1	
R3319	ERJ3GEYJ393	M 39KOHM, J, 1/16W	1	
R3320,21	ERJ3GEYJ750	M 75 OHM, J, 1/16W	2	
R3322	ERJ3GEY0R00	M 0 OHM, 1/16W	1	
R3323-27	ERJ3GEYJ222	M 2.2KOHM, J, 1/16W	5	
R3329	ERJ3GEY0R00	M 0 OHM, 1/16W	1	
R3330	ERJ3GEYJ821	M 820 OHM, J, 1/16W	1	
R3331-51	ERJ3GEYJ220	M 22 OHM, J, 1/16W	21	
R3352	ERJ3GEYJ821	M 820 OHM, J, 1/16W	1	
R3354,55	ERJ3GEYJ472	M 4.7KOHM, J, 1/16W	2	
R3356,57	ERJ3GEYJ222	M 2.2KOHM, J, 1/16W	2	
R3360	ERJ3GEYJ100	M 10 OHM, J, 1/16W	1	
R3361-63	ERJ3GEYJ220	M 22 OHM, J, 1/16W	3	
R3364-67	ERJ3GEYJ100	M 10 OHM, J, 1/16W	4	
R3368-72	ERJ3GEYJ220	M 22 OHM, J, 1/16W	5	
R3373,74	ERJ3EKF75R0	M 0.75HM, 1/16W	2	
R3375	ERJ3GEYJ751	M 750 OHM, J, 1/16W	1	
R3376	ERJ3GEYJ470	M 47 OHM, J, 1/16W	1	
R3377,78	ERJ3EKF75R0	M 0.75HM, 1/16W	2	
R3401-09	EXB28V470JX	RESISTOR ARRAY	9	
R3415	EXB38V103J	RESISTOR ARRAY	1	
R3416	ERJ3GEYJ471	M 470 OHM, J, 1/16W	1	
R3417	ERJ3GEYJ470	M 47 OHM, J, 1/16W	1	
R3418	ERJ3GEYJ103	M 10KOHM, J, 1/16W	1	
R3419,20	ERJ3GEYJ100	M 10 OHM, J, 1/16W	2	
R3421,22	ERJ3GEYJ102	M 1KOHM, J, 1/16W	2	
R3423,24	ERJ3GEYJ470	M 47 OHM, J, 1/16W	2	
R3428	ERJ3GEYJ470	M 47 OHM, J, 1/16W	1	
R3429	ERJ3GEYJ100	M 10 OHM, J, 1/16W	1	
R3431-34	ERJ3GEYJ103	M 10KOHM, J, 1/16W	4	
R3436	ERJ3GEYJ103	M 10KOHM, J, 1/16W	1	
R3438	ERJ3GEYJ473	M 47KOHM, J, 1/16W	1	
R3440	ERJ3GEYJ103	M 10KOHM, J, 1/16W	1	
R3441,42	ERJ3GEYJ220	M 22 OHM, J, 1/16W	2	
R3443-46	ERJ3GEYJ103	M 10KOHM, J, 1/16W	4	
R3447	ERJ3GEYJ220	M 22 OHM, J, 1/16W	1	
R3501-07	ERJ6GEY0R00	M 0 OHM, 1/10W	7	

Ref. No.	Part No.	Part Name & Description	Pcs	Remarks
R3508	ERJ3GEY0R00	M 0 OHM, 1/16W	1	
RTL	TXNHS10ZTT	CIRCUIT BOARD HSA	1	△
SW3301	TSE995	SWITCH	1	
Z3301	H4G1487B0003	VCO	1	

### 8.3. Mechanical Replacement Parts List

Ref. No.	Part No.	Part Name & Description	Pcs	Remarks
	TBMU461	TERMINAL SHEET	1	
1	THEL0239	SCREW FOR INSTALLATION	4	
2	THEL027N	SCREW FOR SHIELD PLATE	4	
3	TPCB13147	CARTON BOX	1	△
4	TPDF1103	CUSHION	1	
5	TPEH135	PROTECT COVER	1	
6	TQE6691	POLY BAG (SCREW)	1	
7	TQZH461-1	INSTRUCTION SHEET	1	
8	TQZH765	INSTRUCTION BOOK	1	△
	XSN26+6FJ	SCREW	4	
9	XZBT6506	POLY BAG (INSTRUCTION BOOK)	1	



## 8.4. Parts Location

